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Inner Cover image (Museums): British Museum, U.K. (courtesy: Gurpreet Singh)

Inner Cover image (Conservation of Cultural Heritage) Wooden Pillar, Sheesh Mahal, Nahan, Himachal Pradesh (courtesy: Gurpreet Singh)

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Editorial

Over the centuries, our history in different shapes and sizes has filled our seas and rivers with hidden or lost stories. Relics of this past are found in almost every part of the world, buried beneath both freshwater and saltwater. Famed underwater archaeological sites include Port Royal in Jamaica and the ruins of the famous Lighthouse of Alexandria on the island of Pharos (one of the Seven Wonders of the World). But above all, there exist 3 million shipwrecks, some of which are believed to contain valuable items. Unfortunately, underwater excavations of such sites have become associated with treasure hunting. But these remains lying in sand or silt are representative of a much greater wealth. With modern diving techniques, the underwater kingdom, its wrecks and its archaeological deposits, have become easier to access and as a consequence are now at risk. Because States have concentrated their efforts on preserving land-based cultural heritage (both tangible and intangible), underwater heritage, for its part, is only partially covered by protective legislation.

On the basis that the principle of cultural diversity will only be recognized if common interests are defended, UNESCO has drawn up a complete set of hard and soft standard-setting instruments for the cultural sphere. These include the 2001 Convention on the Protection of the Underwater Cultural Heritage. Following the example of land-based heritage, this offers States Parties 'common principles' on safeguarding the underwater cultural heritage of humanity. The 2001 Convention came into force on 2 January 2009 – eight years after it was adopted. This unusually long period is a reflection not only of the range of political and economic issues surrounding the Convention, but also of the stormy nature of the accompanying discussions.

In many cases, archaeological artifacts end up in the hands of unscrupulous traders, with the result that whole swathes of human endeavour are lost to science and the public. This being the case, why not allow wrecks to remain in their original surroundings? Indeed, water is also extremely effective in preserving the remains of wrecks it causes. But then arises the question of how to arrange public access. Ambitious museology projects are already being planned in the Bay of Alexandria and the artificial lake of the Three Gorges Dam in China. The once-distant dream of 'underwater museums' as environments not only for divers and snorkellers, but where visitors can view sites without even getting wet, is no longer a figment of our imaginations: it is about to become a reality.

Gurpreet Singh



History and Archaeology

Water Harvesting Structures in Gujarat (Up to Early Historic Times)

[1]R.N. Kumaran and [2]M. Saranya

Introduction

Water harvesting is the activity of direct collection of rain water. According to Wikipedia, 'rain water harvesting is the accumulation and deposition of rain water for reuse before it reaches the aquifer'. It replenishes the ground water table and enables the wells to yield in a sustained manner. The United Nations Assembly adopted resolution A/RES/47/193 of 22 December 1992 by which March 22 of every year was declared World Day for Water. UNESCO has also announced the 2013 as International year of Water Cooperation. Though various methods are now adopted for water harvesting and even some of the states in India had compulsory laws for the same. On this back drop, the ancient structures/techniques adopted by the Gujarat to conserve the rain water from the time of Harappan to Early historic period are discussed here.

Harappan Period

Dholavira, one of the biggest Harappan sites in the Indian sub continent has revealed the advanced hydraulic engineering in the 3rd millennium BCE. According to the excavator, 'the Harappans during their heyday, created within the city walls in all sixteen or more reservoirs of varying sizes. The gradient of 13 m lying between the higher north-east and the lower south-west was ideally suited for carving out a series of reservoirs in cascading manner' (Bisht 2004: 35-48). They were separated from each other by bunds made of earth or mud bricks encased with stones but all are interconnected. Nearly six reservoirs – one on the east and just opposite to the eastern gate of the citadel and the remaining from the southern side of the citadel were exposed. The eastern reservoir is structural one while the main in the south is a rock cut one. Built of well polished sandstone, the eastern reservoir measures 72.50 m (NS) x 29.30 m (EW) with flight of steps on all the four sides to descend to the bottom and was secured by a one meter

high embankment on the west. The most significant one is the rock cut well with a flight of three steps andan enclosure wall. This may be the earliest step well in whole of South Asia.

A series of five reservoirs exposed on the southern side are excavated along the natural rock, packed with stones where the natural rock or veins are soft (fig. 1). The second one is a smaller one in this series which looks like a sedimentation or siltation chamber allowing the fresh water to flow into the main rock cut reservoir with huge outlet connecting with the fourth. This reservoir is provided with flight of steps towards north while a ramp was provided in the fourth one to get to the bottom which in-turn connects it to the spill channel. Apart from these, the citadel has yielded an interesting network of drains provided with air ducts. The purpose of these drains was to collect and let out the surplus of heavy rainfall. There are two large drains – one originating from a salient nearby the east gate and the other from the area close to the north gate. The former is connected to a stone-paved platform provided atop the eastern fortification wall near the said gate. The rain water falling on the top might have been collected there, then would run through a cut stone cascade (fig. 2) and flow



fig. 1 Series of reservoirs: Dholavira



fig. 2 Rain water harvesting technique: Dholavira

into a covered drain running under a broadway. The northern drain issuing from two interconnected chambers is made of stone and located close to north gate complex. Another covered rain water storm drain with manhole at regular intervals was noticed running through bailey in order to carry the water to a deep and broad reservoir that occupied the western part.

The citadel was also provided with a well and two chambers which are interconnected. The diameter of the well is 4.25 m and it is provided with a trough made of three stone slabs, one placed horizontally and the other two vertically along the sides. The basal slab bear rope marks. The vertical slab on the west had an aperture which in turn was connected to a covered drain and let water flow into the above mentioned tanks. Both the tanks were provided with steps to descend and the bases are provided with flat stones.

Lothal has revealed a huge trapezoidal shaped dockyard (fig. 3) of fired bricks, an artificial enclosure for handling cargo and berthing ships. This earliest example presupposes a sound knowledge of hydrography and maritime engineering of those days of the Harappans. Apart from that, Lothal has revealed two circular wells of burnt bricks, one near the dockyard while another one, near the citadel.



fig. 3 Dockyard: Lothal

Khirsara has also revealed a well with an inner diameter of 3.40 m in the heart of the citadel. A rectangular trough has been provided on the western side of the well (fig. 4). It measures 1.60 x 2.20 m. A few rope marks were also observed on them. Apart from this, the excavation at Malvan has revealed a ditch in east-west orientation and had been traced to a length of 18.30 m, with an average width of 1.10 m up to the depth of 1.50 m cut into the natural soil. A number of postholes at intervals were provided on the



fig. 4 Well: Khirsara

south to form some sort of fence. The soil from its original excavation was spread on both sides and in the north. It was banked up to form the basis of a substantial mud brick platform, perhaps originally the base of rampart (?) running along the west of the bank or presumably an embankment intended to provide protection against floods (Joshi 1989: 273; Allchin and Joshi 1995: 34).

Early Historic Period

Nagara has revealed the construction of embankment of some water reservoir around 6th-5th century BCE (Mehta and Shah 1968: 9). The remains of rock cut tanks with a flight of steps, and a dam built with two massive stone walls on either side of the stream to store the rain water was noticed at Taranga hills (Rawat 2010: 96-106). The right wall, measuring 110 m and the left measuring 80 m with an extant height of nearly 10 m, appears as an embankment of a dam. The area near Devnimori and the Meshvo valley have revealed nearly eighteen bunds constructed for water reservoirs and 'these bunds were supported on either sides by either natural hillocks or low hills' in three different series. According to the excavators 'at least some of them are contemporary to the Buddhist and Hindu settlements' (Mehta and Chowdhary 1966: 187). the gaps measuring 0.60 to 0.70 m provided in between the bricks of the monastery at Vadnagar probably facilitate speedy soaking of rain water (Rawat 2011: 216). This is also one type of water harvesting system. Rock cut water cisterns measuring 2.5 x 2.5 x 2.15 m and another one with 3.5 m depth with post holes and channels to drain and store the rain water are noticed in front of the rock cut caves at Kadia Dungar along with small rock cut pits measuring 30 x 30 x 37 cm and 15 x 15 x 22 cm (Sindhi 1999: 19-20). Traces of a reservoir were also noticed at Kheda (Momin 1979: 384).

Junagadh has revealed the mud dam repeatedly mentioned in the Girnar inscriptions of Rudradaman I and Skanda Gupta for continuous breaching and it's repairing from the Chandragupta Maurya down to Skanda Gupta. Roughly measuring 130 m in length from the river bed, 9.5 m wide at the base and 11.35 m at the top level the dam was located on the northwest side of Girnar bounded by Jogannia hill on one side and Uparkot on the other side touching almost the end of Khapra Khodia on the south western side. The trial excavation at Khapra Khodia (fig. 5) has revealed that the bed of the mud dam was constructed by chiseling the natural rock (Pramanik 2000-01: 29).


fig. 5 Mud dam: Junagadh


fig. 6 Khapra kodia Caves: Junagadh

Apart from these, the rock cut caves also displayed that they are meant for water harvesting if not for water storing in Early Historic period. The Khapra kodia caves of 3rd/ 4th century CE contain rain water reservoir and have many water tanks with corridors (fig. 6). At Talaja, a *kund* or water tank was found near the hill, whereas the caves in the Uparkot (fig. 7) in Junagadh show elaborate rain water harvesting with rock cut cisterns, inter connected drains, series of sockets for fixing wooden shutters and a deep rock cut well about 2.74 x 1.52 x 15.25 m while the *vihara* at Intwa has revealed a frontal verandah with water closets measuring 1.75 x 1.25 m (Rajyagor 1975: 210-211).


fig. 7 Uparkot Caves

Further, the wells and step wells, like the one at Suraj kund of Mauryan period and the one at Hathab are instruments for maintaining the underground water (Pramanik 2000-01: 38; 2004: 138-139). A twin well (fig. 8) measuring 1.50 m internally and 3.40 m externally within an enclosure with wedge shaped bricks and another well of rectangular bricks and paved with flat sandstones for the ramp was also noticed at Hathab (Pramanik 2001-02: 36, 42).


fig. 8 Twin well: Hathab

The well is circular in plan with 5.7 m diameter and 9.5 m depth with a narrow entrance, a flight of steps with sandstone pillars along the periphery leads to the first platform. Further, two pathways descend to the bed rock. The bricks below the landing platforms were laid over the wooden logs on all the sides with an *in situ* Kurma carved on the bed rock. The excavations at Bharuch has revealed a cluster of five ring wells in one of the cuttings on the inner fringe of the rampart (*IAR* 1959-60: 19) while Dhor has revealed 'a ring well of coarse grey black pottery where the outside is deurated at the top by a row of impressed angular points, giving the impression of a herring bone pattern' (Allchin and Joshi 1995: 115). Hathab has revealed the soak wells lined with bottomless jars (fig. 9) on the periphery of the moat (Pramanik 2004: 137).


fig. 9 Ring wells: Hathab

The exploration at Kanjetar (Gaur et al. 2009: 75) has revealed a rock cut step well whereas Panchnath Mahadev/ Chorwad (Ajithprasad et al. 2011: 63) has revealed a rock cut well. Siyot, the only cave in the Kachchh has revealed a primitive rock cut step well near the cave. Further, an ancient water reservoir built across a seasonal *nullah* with mud embankment provided with stone boulder veneering and partly by dry masonry wall approximately measuring 350 m in length was noticed at Dholavira (*IAR* 1987-88: 15-16).

Discussion

Gujarat is prone to gambling monsoons. The people therefore, mastered during the Harappan period itself, as is evident from the series of reservoirs, rain water harvesting technique and check dams in the seasonal *nullahs* at many Harappan sites. It not only provides water during a drought, but also helps in reducing the salinity of the soil. The rain water harvesting technique of the Harappans in Gujarat was one of the most innovative in the 3rd millennium BCE. The step well noticed in the eastern reservoir of Dholavira was the fore-runner of similar types with elaborate carvings of the medieval period in Gujarat and Rajasthan. This tradition of rain water harvesting continued even during the Early historic period. This clearly shows the importance given by the authority in providing congenial environment to support irrigation which indirectly increases the revenue to the state. Even, some of the rock cut caves show elaborate rain water harvesting techniques. Further, *kunds* and wells of varied nature also show the development of various techniques applied by the Early Historic people of Gujarat in harvesting rain water.

Therefore, one may infer that the same might also have been constructed in residential areas. These well planned constructions of the drains speak the sanitary system of those times. The material evidences, available so far clearly indicate that the planning of cities, towns and houses were highly developed under a strong technical institution.

The most important part in this series is the step wells of the medieval period which were sponsored by both the royal and the common people. They were not only embellished with sculptures but also with bilingual inscriptions. It is these bilingual inscriptions are another interesting aspect of the architecture, iconography and linguistic history of Gujarat.

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Painted Rock Shelter at Hanumana: A Review

[1]Anupama Singh and [2]Virendra Kumar

Introduction

The Indian subcontinent occupies an important place in the study of the Mesolithic period. India is rich for its culture heritage and tradition, one among those is rock shelters. Rock paintings form a direct and valuable source of information about cognitive and cultural evolution of human kind. Fortunately, India is one of the important countries having richest treasure of rock painting in the world. This treasure is varied in terms of motifs, designs, forms, styles, themes, art in the world.

Rock art paintings are unique creation of human genius playing vital role to construct our history like other literary and archaeological evidences. With the study of rock paintings, history becomes authentic and logical. One such site is Hanumana rock shelter (fig. 10), located at a distance of 7 km from Dramanganj situated in Mirzapur, Uttar Pradesh, on the left side of the National Highway-7 Mirzapur-Rewa. Like every other rock shelters of India, this site is also located in rugged terrain area. Apart from rock paintings, Microlithic tools discovered at this site indicates a settlement pattern of Mesolithic period which especially helps in discovering more about the settlers and their culture.

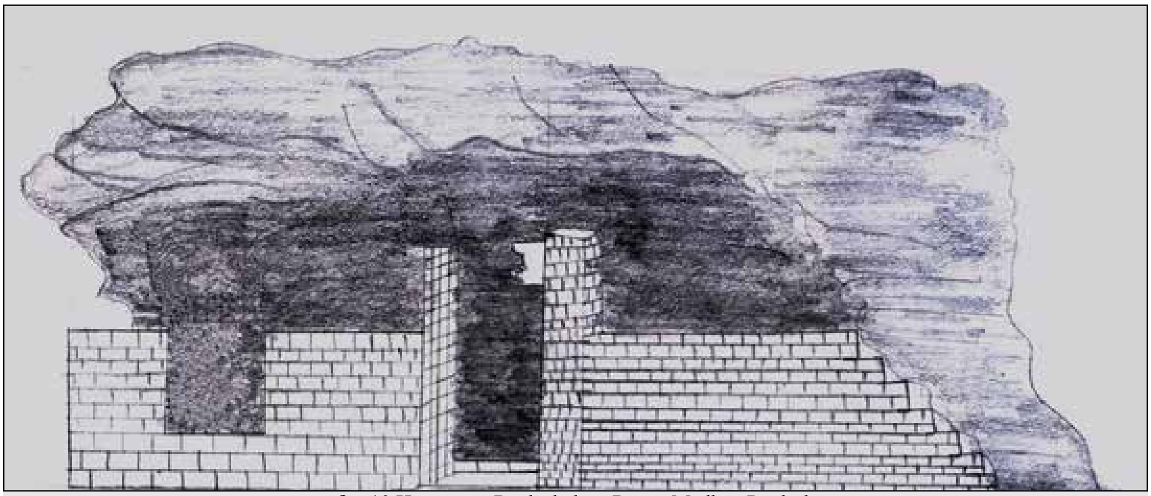


fig. 10 Hanumana Rock shelter: Rewa, Madhya Pradesh

It is known that rock paintings starts from the Upper Paleolithic onwards (30,000 BCE). With the evolution of human species i.e. Homo sapien sapiens, the concept of rock art paintings emerged. The pictures reveals on the surface facilitate what techniques they used and what are the methods adapted during that period. Archaeological remains and History helps us to understand that from the Upper Palaeolithic period; the stone men were fond of art. Now researchers have started working and getting evidences in large extents from many more areas where they left their mark. Hanumana rock shelter is one such finest example to justify the fact. Different forms or styles like tools, pit, paintings, ornaments, cloths, etc. The discussion in my article is about forms and stylistic painting which we found in the rock shelter situated at Hanumana, Rewa in Madhya Pradesh.

From the caves the arts and paintings which associates by Palaeolithic period is considered very fascinating and reflects their capability. Sources of rock art paintings merely helps to reach a very accurate hypothesis and make historians enable to reconstruct history of the people who are no more.

The art of writing started much later and prior to this during early periods, narration of thoughts through pictography was common among ancient people. The depiction on petroglyphs site is difficult to understand but still experts tried to narrate each depiction in more detail. It is very hard to judge and identify the emotions, feelings, gestures and presenting the same through paintings. Still we archaeologists manage it.

There is a controversy regarding the first existence of art in India. In 1880 CE, a Spanish archaeologist, Marceliono Don de Sautuola first proclaimed about the Paleolithic paintings in the Altamira Caves. Since 1880 CE more cave art sites were exposed throughout the globe. The first discovery of Rock art in India by John Cockburn and Archibald Carlyle goes back to 1887 CE.

In Indian context, rock painting is revealed through a long span of time from Mesolithic period and continues up to the historic period, the colouring materials are remained same with some variations and of natural availability, only theme became change which helps us to identify and distinguish to the periods. Rock paintings are found in the

clusters from in the caves of Vindhyan sand stone of Central India and Uttar Pradesh, Karnataka, Andhra Pradesh, Rajasthan, Bihar and Orissa. Most of the paintings are from the Mesolithic, and some are from the Upper Paleolithic, the Neolithic and Chalcolithic period. The paintings are both static and dynamic in action. Some of the paintings are called X-ray paintings as they reveal the internal structure of the figures. The subjects of the paintings are found in the form of hunting, dancing, fighting, trapping, fishing, shooting the birds, and collecting the bee, showing the domestic animal, riding of the horse, elephant. The subject matters of the paintings are - animals, human beings, decoration, designs and symbols.

Present Status

This rock shelter is broken from all the sides. A brick structure veneered with mortar of cement and sand has been erected on the front and back side of the shelter. It is vandalised badly and has a man-made entrance. No evidence of artifacts inside the shelter have been found because of the paving of floor yet within 30 m peripheral area of this rock shelter, the Microlithic tools (various types of blade and bladelets), wastes, fluted core and, etc. have been reported during exploration.

Rock shelter is studied on the basis of the present paintings. Authors have also tried to date it on the basis of the style and subject. This evaluation is based on the published reports and books of scholar like Erwin, Radha Kant Varma, S.K. Pandey, and Rakesh Tewari which are used as key indicators or key sheet. The concentration of the paintings are found at the front and back ceilings of this rock shelter.

Flora and Fauna

The area is dense forest. The trees are medium sized and the growth is stunted. They are of the nature of scrub jungle. The most common trees such as bargad *(Ficusbenghalensis)*, pipal *(Ficusreligiousa)*, imali *(Tamarindusindica)*, aonla (*Emblicaofficinalis)*, tendu *(Diospyrosmelanoxylon)*, palas or dhak *(Butearnonosperrna)*, parsdoh *(Hardwickiabinata)*, mahua *(Madhucaindicagmel)*, bamboo *(Dendrocalamusstrictus)*, Sal *(Shorearobusta)*,

etc. are found. The Sambhar and Cheetal are found in this region. Nilgai is very common and is found everywhere. The area is equally rich in bird life too. The peacock abounds in areas adjoining cultivation along with the black and grey partridges. Hoopoe, woodpecker, green pigeon and parakeets are fairly common.

Depiction of the Paintings

The paintings have been executed, generally on the smooth surface of the ceiling of the rock shelter. There are many paintings of earlier period, which are noticed that they are super imposed by the subsequent paintings due to which some time it is very difficult to identify the paintings of a particular phase and to ascertain the number of super impositions. In this rock shelter, numerous scenes are depicted such as the scenes of hunting, trapping, riding on elephant, floral designs, dancing, geometrical designs, wheels, sun, spider, Scorpio, etc. The paintings are generally executed in ochre red colour. Paintings in the rock shelter are sub-categorised below:

1. Scene of Hunting
2. Scene of War and Warriors
3. Depiction of Animals and Anthropods
4. Depiction of Floral Design and Others

Category I: Scene of Hunting

Hunting is the most illustrated subject of rock-paintings. Animal with spear, harpoon or arrows either embedded in their chest, touching them or aimed towards them with the weapon in the hands of the hunter. Remarkable thing is that there is no depiction of group hunting in this rock shelter generally one animal is shown being hunted by one hunter. In this rock shelter there are numbers of hunting scene amongst which a few are as follows -

1. This painting has been executed in the light shade of ochre colour. This is identified as war scene (fig. 11a-b as on p. 20). Stylistically and thematically, the date of this painting goes back to the Mesolithic period (Kumar et. al 1992: 58).

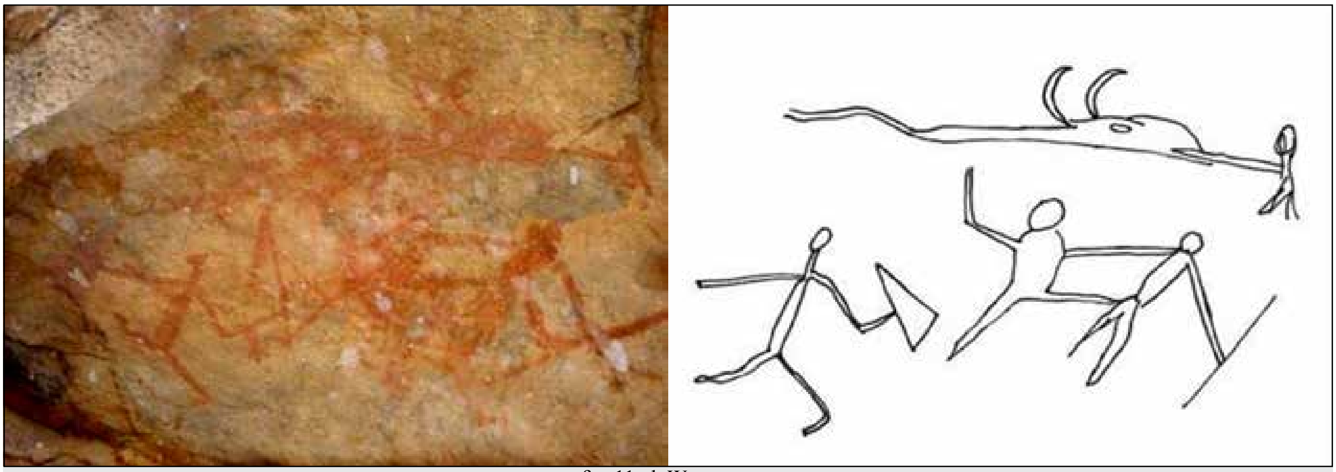


fig. 11a-b War scene

2. There is another hunting scene in which the hunter is riding on an animal and shooting a wild pig with an arrowhead (fig. 12a-b). Artistically, this painting shows the intellectual level of painter. In this painting, the painter tries to show even hoofs and tail of the animal in circle. The hunter looks like an archer. This type of pointed arrow heads is generally considered to belong to Chalcolithic period (Kumar et. al 1992: 59).

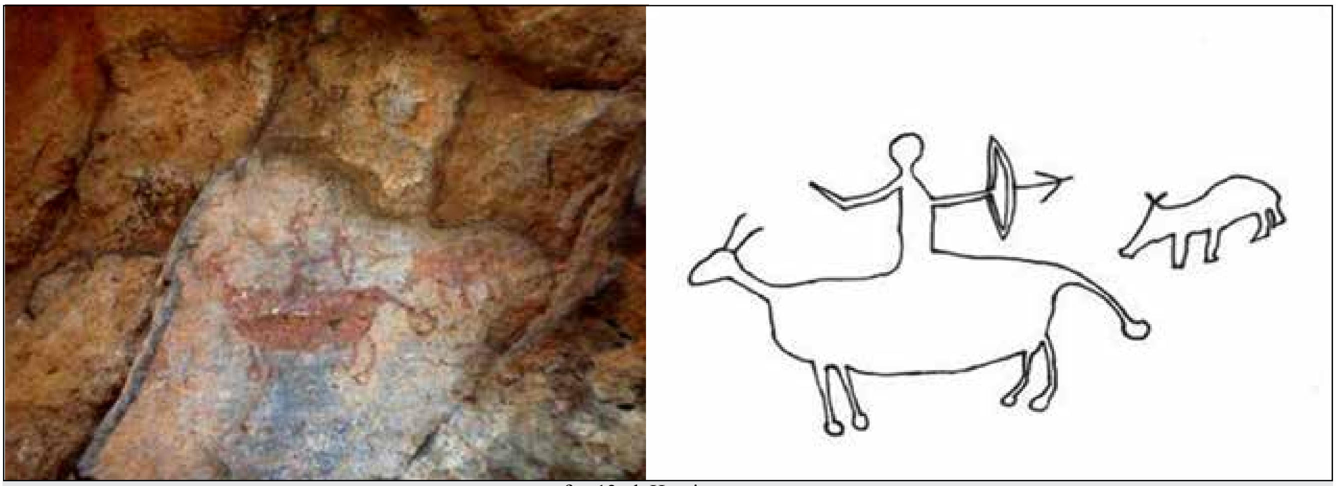


fig. 12a-b Hunting scene

Category II: Scene of War and Warriors

War and warrior scene is common in rock shelter paintings but in this particular rock shelter such kind of scenes are less in number, It has two paintings, one is of anthropod and other scene is of warrior who erectly stands on animal or bird with sword in his hand.

A similar picture has been reported in Gardada, River Chhaja, Bundi in Rajasthan which corresponds with Chalcolithic period (Sharma 1998: 70).

There is an interesting scene depicted here in this painting where two warriors (fig. 13a-b) are facing each other. Here one painting is comparatively large in size. The painter tries to show the distance between the two warriors through size.

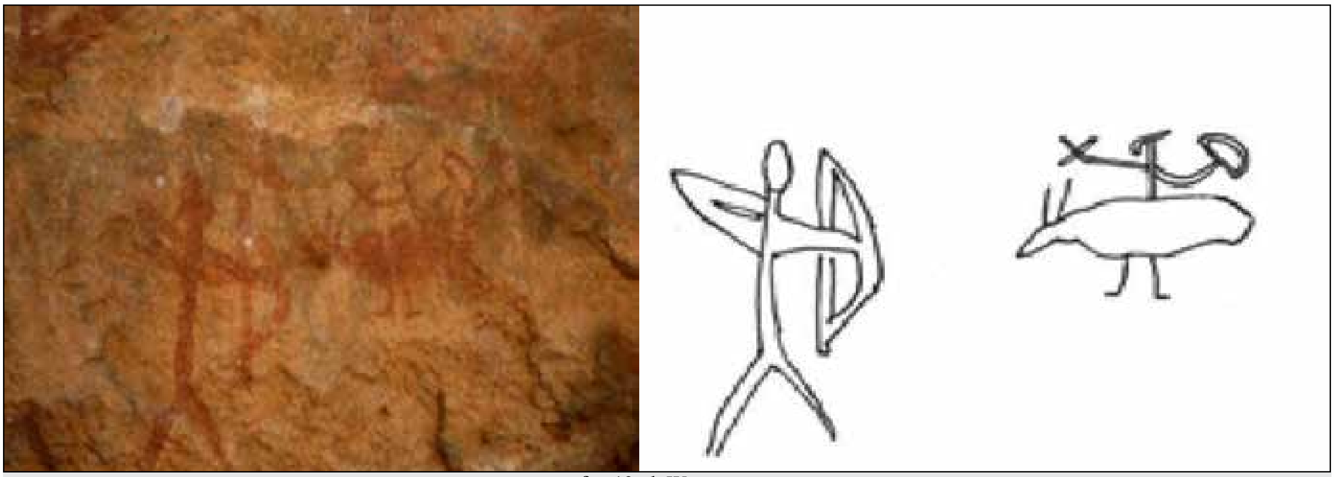


fig. 13a-b War scene

Category III: Depiction of Animals and Anthropods

Animals and anthropods is much focused subject in the rock shelters. In this rock shelter there are several animals scene are depicted in different form and posture such as static and running. Some important figures of elephant, deer, humped bull, pig and others, etc. have also been illustrated here.

Elephant was shown in running posture and its tail and trunk are slightly raised and a warrior seated on it holding a sword and shield.

Apart from this, depiction of a humped bull has also been illustrated here in dark ochre shade (fig. 14a-b). good example of superimposed scene These kind of pictures

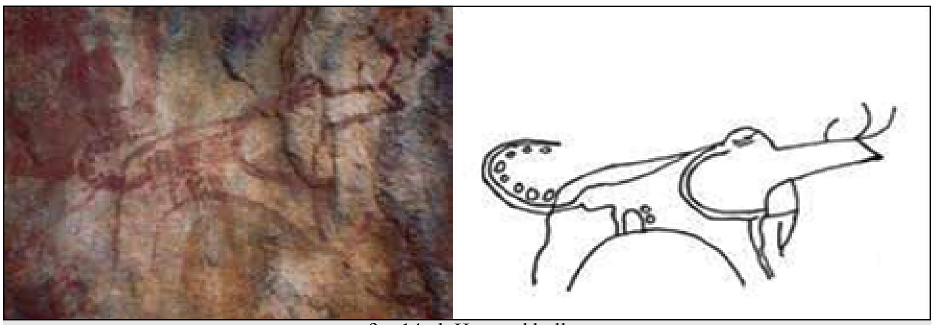


fig. 14a-b Humped bull

are generally found in Mirzapur and its neighbouring area. This type of paintings is associated with the Chalcolithic period. This is anthropoid picture and drawn in light ochre shade. This figure is in standing posture and his right hand is bent towards up and left hand placed on west. This painting stylistically belongs to early period.

In the first site it gives the impression of a warrior who is ready to fight in a war. But in other instance it appears that there is a group of warriors who are following each other. Two pictures of the warriors are too eroded to identify (fig. 15a-b) but two are clear and they depict warriors holding swords and shields.



fig. 15a-b Warriors holding shields

Category IV: Depiction of Flora and Others

Paintings with floral designs have also been found in this shelter. There is a group of painting depicted here, wherein, (fig. 16a-b) one is of a man whose both hands are erected up and legs are folded inside. Other



fig. 16a-b Depiction of man and a square shaped design

scene on same canvas is square in shape which has ten depictions of palms. A floral design has also been depicted near to this painting. These two paintings are considered to be of late historical period (Kumar 1992: 28). This type of designs and paintings are fashioned in local villages even today.

At one part of the rock shelter there are three painting in a group. This is another example of superimposed painting in the rock shelter. In one group, scene of sun is dominantly focused and its rays are fully noticeable. Second group of painting shows a pig head which is trapped and hanged. Third group of painting is of two men who are standing holding hands. Chronologically, it looks later in date.

There is another depiction of seven spoked circles which looks like potter wheel. It is painted in red colour. There is another group of painting in which one looks like a spider web (fig. 17a-b) and there is a wavy design underneath. The co-relation of two designs is not clear.

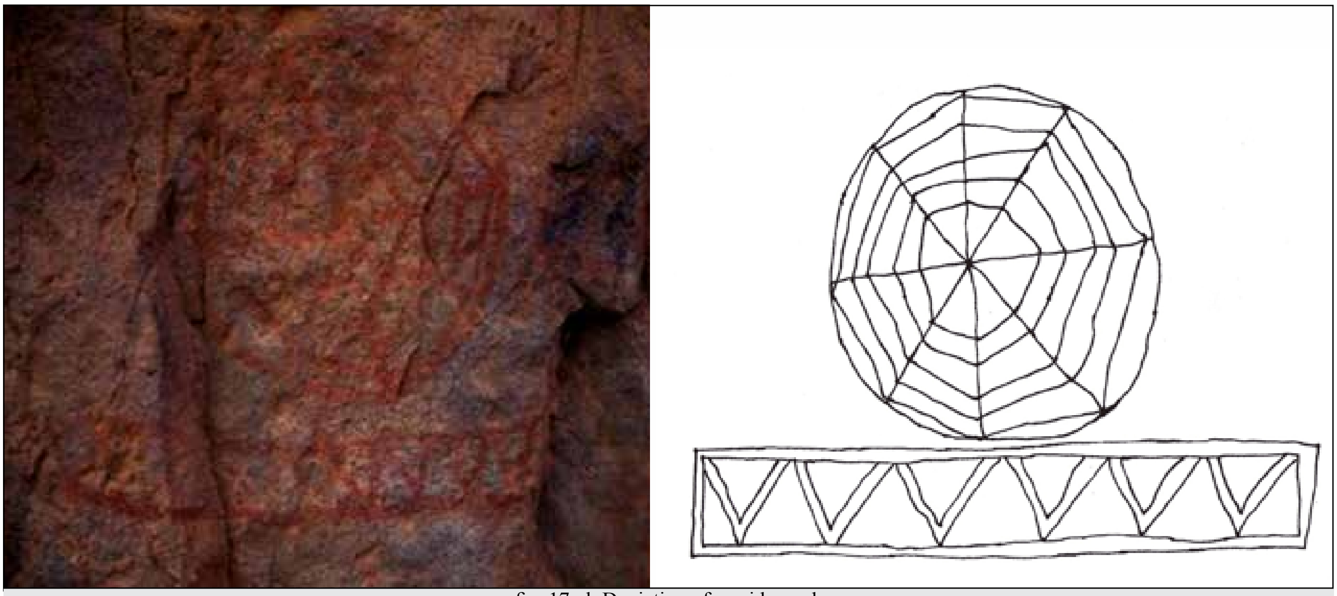


fig. 17a-b Depiction of a spider web

There is also a group of painting (fig. 18 as on p. 24) which reveals palm depiction at the left corner of the canvas. This type of print is very commonly illustrated in the villages during rituals, festivals and any important social ceremonies. There are numerous dots in the painting, locally known as tika. Another interesting painting sketched here is a vertical line crossed by four horizontal lines. Surrounding 30 m of the rock shelter, microlthic



fig. 18 Depiction of palms, lines and dots

tools, chunk, wastes, and fluted core, etc. (fig. 19) were discovered during the exploration. As far as raw material is concerned, these tools are fashioned on chert and agate. Their shapes reveal different kinds of blades and bladelets.



fig. 19 Chunk, cores, blades and bladelets

Issues and Remedies

It is known that Archaeological Survey of India is the largest government institution in India which bears the responsibilities of preserving and

conserving the legacy of the past. Besides, there is State department of Archaeology and other agencies like INTACH and UNESCO also doing their efforts on their level. Though these organisations perform their praiseworthy duties yet we, common masses also should come forward to support these institutions. At Hanumana rock shelter, it has been observed by the authors that it is completely encroached. It has also been observed that this rock shelter is broken and fractured from almost every side because of ignorance and blind faiths. Some damages have also been occurred due to natural fury and human vandalism. This rock shelter requires immediate attention and preservation. Looking at the present condition of the rock shelter, a few solutions came in the mind of the authors likewise - group of young scholars interested in prehistory and rock shelter along with experts of the field and well familiar persons of the area may expose the problems to get noticed by the veteran, government and non-government agencies. Some remedies observed by the authors are listed below -

1. Demarcation of the site and proper documentation,

2. Aware and alert the common mass and neighboring of the rock art site,

3. Use the signage with instruction regarding safety,

4. Generate awareness amongst the students regarding heritage,

5. Budding scholars should come ahead and spread the concentration either side,

6. Stop continuous mining near rock art or shelters,

7. Take proper guidelines from the experts of the field,

8. Extending training to students and researchers for proper documentation of the rock paintings,

9. Organise seminars and workshops to create awareness among people,

10. Exhibitions on rock paintings,

11. Promotion through media for creating awareness about legislations, rules and orders.

Observations

This rock shelter is an important discovery, not only because of a shelter but because it has revealed paintings from prehistory to historical period. There are several paintings which are superimposed and indicate that some shelters were in use for a long period, in other words there was a continuous settlement.

Findings of the microlithic tools increase the significance of this rock shelter. Besides microlithic tools (blades and non-geometrical) fluted core, chunks and broken core wastes have also reported been reported from this site. It may be an indication of a factory cum habitational site.

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Museums

Role of Education in Museums

[1]Nalini Naik

What are museums for? What is the purpose of all the efforts in collecting, restoring and displaying objects? It is certainly not merely an occupational therapy for curators or those who do research in the field. It is also not only about the pride in representing the culture of a nation or of the world's common heritage. In fact, this is undertaken in order to make the museum's knowledge and collections known to the public, to people of all ages and backgrounds, and to let them participate in knowledge and culture. Consequently it is important that every action of the museum should aim to serve the public and their education (Bellamy and Carey 2009: 1-3).

Definition of Museum

According to International Council of Museums (ICOM) Museum is a "non-profit making permanent institution in the service of the society and of its development and open to the public, which acquires, conserves, researches, communicate and exhibits for the purposes of study, education and enjoyment, material evidence of people and their environment''.

UNESCO definition of museum is as follows:

A museum is a medium of life-long education through which an awareness of the social, economic and political aspects of scientific, technological and environmental development could be created.

A descriptive definition of museum adopted by the Museum Association of India is as follows:

Museum is a show window of knowledge.

a. Promotes national integration

b. It is a mine of knowledge and source of recreation

c. It preserves the past for the future

d. It is a synonym of education and entertainment

e. It brings people together

f. It is a mirror of our traditions

In the late 18th century, a museum was considered to be a building used for the storage and exhibition of historic and natural objects. A nation's past is reflected in a museum through its collections which are nothing but the silent witnesses of art, architecture, craftsmanship, etc. representing the rich cultural heritage of the past (*ICOM* 2004).

There are many more definitions of museum that lay most emphasis on their role on education. The educational activities within the museums must be ready to provide a great variety of methods through which people can receive insights into and enjoyment of collections. The presence of objects that do not know the boundaries of language and literacy helps museums to be on advantageous position compared to other public service agencies, to serve as socially relevant agency for the education and development of the community. The earlier museums were scholarship oriented, opened to scholars and members of royal houses, with object of curiosity (Srivastava 1985: 59-60). The common people did not have access to it. The two notable events in world history, viz. The American war of Independence (1776) and The French revolution's declaration of human and civil rights (1789) were turning points and opened a new vista for the development of education and culture. This new development further intensified the collection of objects of art and culture and a gradual increase in public access to museum collections. Education was put as one of the major function of museums. Apart from this, in the past, the responsibility of the Museum officials was limited to acquisition, conservation, research and display of different art, archaeological, ethnographical, scientific and technological objects. But in the modern world responsibility of the Museums have much wider role for the visitors. The visitors not only look at the objects and admire and enjoy them, but also learn from them and pass to the succeeding generation (Singh 1969: 70)

Origin of Museums

The word 'Museum' is derived from the Greek language. "Museo, the temple of the Muses", the very word conveys to the place of learning and study. Thus, the temple of Muses was the temple of learning from the very inception of its evolution. It was applied to the sacred place 'mouseion' or the temple of 'muses' (Biswas 1996: 1). The Muses were the Greek goddesses of art and learning. Mouseion means inspiration and a place where a man's mind could attain a mood of aloofness above everyday affairs. Since its beginning in 283 BCE, when the first 'Museion' was established by Ptolemaies-I in Alexandria, the museum as an institute has been changing its concepts, functions and forms to meet the situations (Biswas 1996: 1-2). The word 'Museum' for a collection first occurs in the late 15th century CE. Thus, the mansions or Chambers housing art; curious and rare objects of nature were the new kind of institutional museum phenomenon, which for all variety, was in essence a form of museum.

The Greek mythology refers to the nine Muses viz. Calliope, Clio, Euterpe, Thalia, Melpomen, Terpsichore, Erato, Polymnia and Urania. In the course of time, these were personified and they sang and danced under the direction of Apollo. These nine muses presided over nine different sections of fine and liberal arts and sciences. This calls for a parallel evolutionary story of museums in India. Paramara king Bhoja is credited as the first Indian king to build a temple of muse in 11th century CE. He installed an image of Sarasvati within a temple at Dhara and thereby, he turned the temple as a temple of learning- 'Sarasvati Mandira'. This association never ceased to exist and even in present century, a few museums in Rajasthan and Gujarat are called 'Sarasvati Bhandar' (Naik 2012: 1-2).

Museum Education

Of all the activities of a museum, to educate the visitors should be given without hesitation. A museum is neither a school nor a college; therefore, formal system of education cannot be entertained in a museum. But as a non-formal centre of education, a museum can positively play a significant role in the field of education.

Education is defined as the process of experience, generally called learning which brings in desirable changes in human behaviour; with respect to knowledge, outstanding skill and attitude (Khanna 1982: 40-42). A Museum is not an educational institution in the formal sense of the word. It is an informal education that one receives at museum. Eilean Hooper-Greenhill (1988: 7-8) considers museum in the context of education, as an institution that can offer an educational experience across a wide range of variables and in relation to a wide range of institutions and organisations.

The meaning of museum education is that museums provide a learning situation in which the visitors experience learning. A learning situation is a condition or environment in which all the elements necessary for promoting learning are present. Learning experience is the mental or physical reaction or makes through seeing, hearing or doing the things to be learnt and through which one gains meanings and understanding of the materials to be learnt (Nigam 1982:1-7).

Learning in museums generally involves a visitor or a group of visitors attending to an object, a display, label, person, element or some mental construct of these. Museum learning has long been examined in relation to attracting power and loading power of exhibits in museums. The information thus collected by the visitors is stored in the brain and remains there over a period. Museums are rather a source of intellectual stimulation and entertainment. Exhibition halls or galleries, properly arranged secondary collections, labels, guided tours, traveling exhibitions, school class visits, loan services to the schools, training courses to the teachers, illustrated lectures, motion pictures, film trips and publications, etc. are the various means which constitute the educational activities in a museum (Singh 1973: 75-78).

Some scholars emphasized on the necessity of an education wing in a museum. There should be two sets of staff in a museum. One set of staff would look after the work of documentation, preservation and processing the collection, and the other set of staff should exclusively carry out the educational activities in a museum (Biswas 1996: 10-11).

Assessing the Principles and Priorities for a Museum Education Policy and Programme

As every museum is unique, the museum educator, in consultation with curatorial colleagues, needs to ask some basic questions in analysing and planning the education service (Edson and Dean 1994: 5-10). These will differ according to circumstances, but may include:

Concerning the geographical situation,

1. Is it serving a big or small community?

2. Are the surroundings urban/industrial or rural?

3. Does the museum relate effectively to its geographical situation?

Concerning the social and cultural structure of population,

4. What are potential visitors like?

5. What visitors and other users do we want to come to the museum and why?

6. What are the community's cultural traditions: can these be linked to the museum's objectives and policies?

7. What are the contemporary problems the community has to cope with?

Concerning Museological issues,

8. What are the key features of the collections?

9. What are its origins?

10. What are the museum's obligations towards outside parties, such as the State, city, other funding bodies or donors?

Concerning finance,

11. What funding sources are available specifically for educational work?

12. What is the most effective use of the available museum education budget?

Designing Educational Programs: Basic Principles

1. Start from the knowledge and life experience of the audience.

2. Provide opportunities for conversation and discussion that help students to handle new ideas and to develop reasoned arguments.

3. Offer first hand experiences for the senses and the mind including:

a. Looking

b. Describing

c. Touching

d. Moving

e. Drawing

f. Playing

4. Let the student or other visitors find his/ her personal expressions for what they experience.

5. Allow the opportunity and time for individual exploration.

6. Plan any programme of educational visits carefully, taking into account e.g. the schedule of the local school year, the season of the year, and the time of day.

7. Allow the group time to adjust to the new teaching and learning space in the museum.

8. Build into the programme preparation before the visit (e.g. pre-visits or training courses for the school's own teachers, or the written information or learning materials provided in advance) and the follow-up to the visit.

9. Evaluate each visit or organised programme and consider possible changes for the next time (*UNESCO* 1960).

Educational Spaces

A promotion of education in a museum must go along with the provision of adequate spaces for this work. These can be exhibition areas that focus on educational exhibits designed to illustrate a particular topic, classrooms, workshop spaces or other study areas that can be used for an extended period of time by school and other educational groups as well as by the individual visitor (Banerjee 1990: 53-55). Special museum education spaces are usually supplied with supporting information and material which allow intensive and active examination of topics covered.

How a museum can educate its visitors and what are the methods adopted by a museum to do the same are as follows:

One of the best ways to educate visitors in a museum has been through 'Presentation of collected materials'. A museum educates its visitors through exhibition of its collected materials. It is the responsibility of the museums, apart from other functions to impart education through exhibition to the masses irrespective of their educational background. The exhibition is the only language through which a museum can communicate and in order to make a direct impact on the masses, the exhibition has to be meaningful. A museum may display its materials keeping in mind the educational role in its own way. Exhibitions should not only be correct and understandable, but they should also appeal to the mind, the emotions and the senses of the visitors. Learning directly from the objects provides a first-hand experience to the learners. For example an individual who has seen and handle few fossils or examined an exhibit showing how fossils are formed would have a better knowledge about fossils than those who have only read about them (Biswas 1996: 11-12).

Didactic/Educational Exhibitions

In contrast to a more traditional object-oriented presentation, a didactic or pedagogic exhibition is often argument-oriented. This is achieved by making sure that -

1. Educational aims are prominent in the concept,

2. Content, design, and educational assistance must be closely related to the argument to be conveyed, and that

3. The particular target group at which the exhibition is directed has a priority. With educational exhibitions, active styles of teaching should mainly be used.

Audio-visual Aids

An object on display cannot communicate and, therefore, to establish communication between objects and visitors, certain audio-visual aids are to be included to make objects speak. Audio-visual aids which an object on display may be in the form of labels, maps, illustrations, kiosks, graphs, charts, dioramas, sounds and documentary video shows. Label of an object gives visitors brief and first-hand information. Basic information about an object in regional language helps a visitor to get a better understanding. A curious visitor may also wish to know more about an object so it is necessary to have an introductory label provided to them. A map may help visitor in knowing from which part of country the object has come from. Dioramas are the best way of communicating and educating visitors. When a natural history specimen has been implanted, it can be set in its ecological setting through diorama (fig. 20). It is of great educational value to accelerate the eco-system in which the specimen has developed and thus the diorama gives an idea of what things are actually like. It is generally used in natural history section of a museum. Apart from flora, fauna, habitats it may also include sounds (of birds and animals), smell of a particular environment, etc. (Bucknell 1965: 19-22, 30).



fig. 20 Ecological setting through diorama (source: Museum of Christian Art, Goa)

Role of Museum Curator and Guide Lecturer

The skill of a Curator, i.e. exhibiting the objects in such a way that the visitors are automatically drawn towards it. Label, both big gallery labels and short individual ones, in many cases, are needed for identification and understanding. The short labels should be crisp and meaningful. The curator decides the subject-matter. Guide lecturers at museum play a vital role in imparting education to the visitors. A guide lecturer must be efficient and knowledgeable. They educate visitors by their verbal explanations. In a gallery talk or while demonstration lecture, a guide lecturer can throw more light, give more information than the displayed objects and the related audio-visual aids could render.

The most common educational programme in any museum is the guided tour generally by the staff members (Baxi and Dwivedi 1973: 97-98). An audio-visual programme on a brief introduction explaining the background of the exhibits prior to the visit will probably leave a better effect. Besides, there are other electronic lecture guides, such as loop aerial system and the static speech-reproducing box which are found to be very helpful to the visitors. In the loop aerial system, an ordinary tape recorder plus an amplifier act as a broadcasting station which feed a loop aerial fixed around the ceiling of the gallery (generally used in temporary exhibitions, author has not seen it in India yet). The recorded lecture is received through the agency of a portable receiver, which the visitor carries with him. In the speech reproducing machine, a small box is stationed near the particular object. The visitor can listen to the commentary after pressing the appropriate button. This system does not provide guided tour to the whole gallery but suited to a suitable interesting exhibit. One can find such system at Chhtrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai.

Outreach Programmes

The museum today is regarded as an institution that must have a strong relationship with, and responsibility towards, society. It has to serve a very wide and diverse public, from enthusiastic regular users and supporters, through to those who know little or nothing of the museum and what it offers and never visit the museum building. Also, economically disadvantaged communities and individuals may not be able to afford the

time or money to travel to the museum. Outreach programmes can overcome this gap, by offering opportunities for experience and learning to schools and individuals living in places without museums, e.g. rural or remote areas. They aim to make members of the public aware of the value of the museum and its services with the aim that they will be eventually attracted to visit the museum in the future.

Field Trips

Education to the students can be imparted by organizing field trips that fall within the educational scope of the museum. Natural History museums, concerned with environmental education should organize such field trips in order to develop in depth understanding and love for nature, ecology, wild life, flora and fauna, conservation, etc. Since school education is too much examination and curriculum oriented, museums of all types can take a lead to organize such programmes to enhance the quality of education. Such visits should be followed by memory tests and on the spot competitions in drawing and painting, quiz and contest on ecology and environment. During archaeological, geological or biological fieldwork, students and volunteers may be able to undertake collecting and categorizing specimens, so that the participant becomes actively involved in the learning process with the result of sustainable knowledge. A museum can organise excursions to monuments and sites, and to other museums and places. In these cases the museum educators are acting as programme designers, relating the museum to the outside world.

Summer Classes and Courses

The museums in collaboration with schools and Non-Governmental Organisation (NGO's) can hold summer classes in painting, crafts, modelling or on environment exploration (fig. 21). These programmes not only develop the skill and talent of the students, but also make youngsters aware



fig. 21 Special summer programs for Children in Museums (source: Museum of Christian Art, Goa)

of environmental and cultural issues and the way they can maintain in contributing conservation efforts. Courses on display, exhibition, conservation and museology may be arranged at the museum. Those people who are interested in these fields can enhance their knowledge and get training at museums also.

Publication and Research

Information on the collections or a temporary exhibition can also be conveyed through the classic medium of a book, booklet or catalogue. The text and illustrations can consolidate knowledge and reactivate experience of the exhibition. It is important that the museum keeps in mind the intended readers and users: publications, guides and catalogues for children and teenagers need to be designed accordingly. In contrast the more advanced reader will appreciate fuller information and interpretation and also the results of the more advanced research carried out by the curators or outside specialists.

Apart from providing the fundamentals of knowledge in the specific fields, the museum preserves and provides the basic material for research in practically all the academic disciplines like art, archaeology, anthropology, science, dance, music, technology, etc. Museums are the best centers of bringing out research works of repute. Since the Curators have a direct access to the original source material.

Practical Workshops

Activity workshops, which may be conducted by freelancers who are specialists in their fields such as working artists, scientists or crafts people, offer visitors the possibility to explore techniques connected to the making and preserving of cultural objects, or to undertake scientific research or inquiry. For example, traditional crafts like pottery, wood and metalwork, cooking, fire-making, paper beads or other local traditions may be experienced and rediscovered. Art is better understood through trying out the original techniques of printing, drawing, painting, sculpting and photography. Using a microscope, excavating, taking pictures and systematising information on objects for archival research may give an introduction to scientific work (fig. 22 as on p. 40).



fig. 22 Practical workshops for Children in Museums (source: Museum of Christian Art, Goa)

Teaching "Kits"

Educational aids and sets of handling specimens can be assembled in carrying boxes, suitcases or any other sort of container. They can be used either in the museum as teaching material by the educators themselves, or being self-explaining by the independent visitor. Material that is put together in such kits usually focus on specific subjects which are derived from the museum's collection and general programme, and offer a wide range of supplements and aids for learning, such as written information, pictures, recorded voices or music, replicas, raw material to be touched or used for creative work, games, how-to-do-instructions, worksheets (Singh 1969: 76, 79).

Museum educators therefore need to design a wide variety of both formal and informal programmes that are meaningful and at the same time entertaining, so that even after a day at school or work, participating in workshops, courses or events at the museum provides them with experiences that enhance their quality of life.

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Conservation of Cultural Heritage

Antifungal Activity of Aqueous Plant Extract of Pongamia Pinnata against some Isolated Aeromycoflora of Shiv Temple, Deobaloda, Chhattisgarh

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Introduction

Many chemicals have been developed and used as biocides for the conservation and preservation of cultural heritage. But due to the hazardous and many side effects of these chemicals, more and more emphasis is being given to the use of bio-control agents. Today, the major challenge for conservators and scientists in the field of conservation of heritage properties is to introduce some eco-friendly and safe alternatives to control the fungal and other micro-organism growth on the surface of the monuments. Researchers had to turn their attention to plants and micro-organisms as sources of bio-control agents (Mondall et. al 2009: 49-53).

There are several monuments in Chhattisgarh state and Shiv temple (21°13’08”N lat., 81°28’24”E long.) (fig. 23a-b) located in a small village called Deobaloda, is one of the significant temples in district Durg of Chhattisgarh. Its east facing edifice built of sand stone is surviving with a *garbhagriha* and a pillared Navaranga *mandapa*. The *sikhara* is missing which was probably in *Nagara* style. Its *garbhagriha* houses a



fig. 23a-b Shiva temple, Deobaloda (front and lateral view)

Shiv linga, which can be approached through a highly ornate entrance guarded by Saiva dwarapalas accompanied by attendants. Ganesha is depicted on the *lalatabimba* and the *mandapa* pillars are adorned with images of Bhairava, Vishnu, Mahishasurmardini, Tripurantaka Shiv, Venu Gopala, musicians, dancers, *keertimukha* designs, etc. The exterior of *adhisthana* portion of the temple bears decorative bands of Gaja, Asva and Nara. The *bhitti* portion has two decorative segments, adorned with images of Tripuarantaka Shiv, Gajantakashiv, Narasimha, Nruvaraha, Parvati, Radha-Krishna, Ganesa, Mahishasurmardini, Laxmi, Trivikrama, Venu Gopala, Kesi vadh, etc. This Shiv temple constructed by the Kalchuris can be dated to 14th century CE (Mishra et al. 2012: 36-37).

Material and Methods

Isolation and Identification of Fungal Species

A total of five samples from different surfaces of the monument were collected. During the investigation period PDA media was used for the isolation of fungi. A few drops of sample were poured in the petridishes and the same were kept for incubation at 28±1^{0}C for 7 days for incubation (Sharma and Lanjewar 2010: 47-49). At the end of incubation period, fungal colonies were counted, isolated and identified with the help of available literature and finally sent to National Center of Fungal Taxonomy Delhi for identification.

Extraction of leaf extract

5.00±0.05 g of dried and ground leaves of karanj *(Pongamia pinnata)* was placed in a thimble (fig. 24a-b). Sample was extracted in a Soxhlet extraction system using 150 ml of solvent (distilled



fig. 24a-b Karanj tree and its dried leaves

water) (fig. 25a-b) and the heating power was set for two cycles/hours so that six cycles of extraction was achieved within 3 hours. The crude extract solutions obtained afterwards, was concentrated using a water bath at very low temperature to remove the solvent and finally dried in an atmospheric oven. High temperature treatment was avoided to minimize the component degradation (Kumoro et. al 2009: 306-309). Extract was then stored at room temperature before weighing gravimetrically to determine the yields after that prepared various dilution viz. 0.1, 0.3, 0.6 and 1% concentrations of extracts for inhibition of growth of fungal species. Control treatments were without any plant extracts.

Percentage inhibition of fungi growth by the leaf extracts was calculated using the formula (Mondall et. al 2009: 49-53).



fig. 25a-b Soxlate apparatus (left); and process of making extract from leaves of Karanj tree (right)

$$\% FG = \frac{Dc - Dr}{Dc} \times 100$$

% FG = % inhibition of fungi growth, Dc = diameter of control, Dr = diameter of test

In vitro tests

Dominant fungal species were selected for experiment and maintained in pure live on Potato Dextrose Agar (PDA) slants at 4^0C for evaluation of in-vitro antifungal activity of the biocide (Plant extract of Karanj). Phytoextracts were added to Potato Dextrose Agar (PDA) medium in different concentrations (0.1, 0.3, 0.6 and 1%) in separate sterilised petriplates (fig. 26a-b and c). Each plate was inoculated with a mycelial disc (5 mm diameter/ 250 mm diameter) taken on PDA.

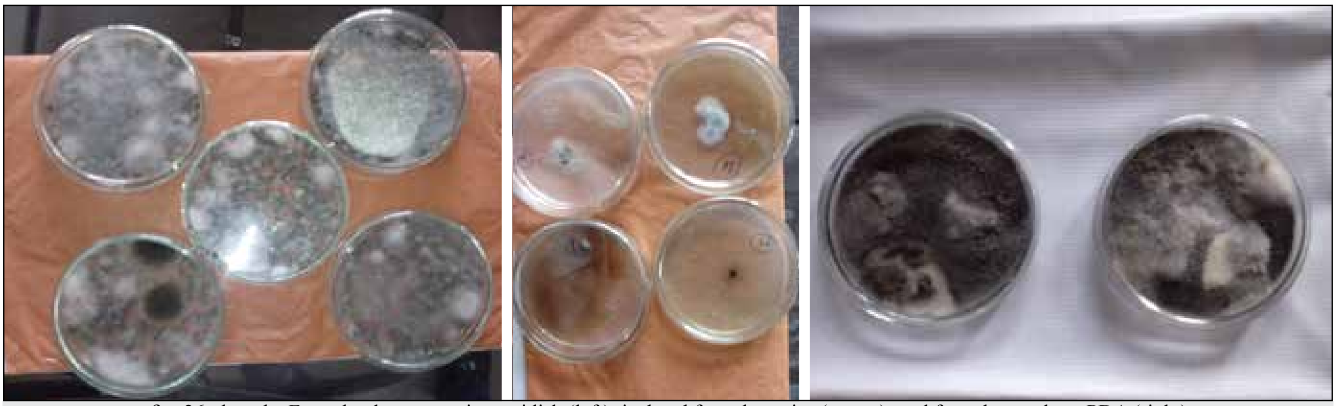


fig. 26a-b and c Fungal colony grow in petridish (left); isolated fungal species (centre); and fungal growth on PDA (right)

Table 1: Standardisation for number of drop of extract on fungal growth

Dominant fungal sp.	Number of drop	Effect of extract on fungal growth	Number of drop	Effect of extract on fungal growth	Number of drop	Effect of extract on fungal growth	Number of drop	Effect of extract on fungal growth	Number of drop	Effect of extract on fungal growth
Concentration	Blank (0%)		0.1 %		0.3%		0.6%		1.0%	
Aspergillus niger	-	-	1	x	1	x	1	x	1	✓
	-	-	3	x	3	x	3	✓	3	✓
	-	-	5	x	5	✓	5	✓	5	✓
	-	-	7	x	7	✓	7	✓	7	✓

X - no effect

✓ - effect of extract on species

The inoculated plates were incubated at 28 ± 1°C and the diameter of the colony of pathogen was measured after 3 days (Dutta 2001) for the 5 drop experiment of different concentrated plant extract standardised for the study of antifungal activities of plant extract for all dominant fungal species.

Results and Discussions

In vitro tests: Results displayed by the aq. extract of Karanj against A. niger, A. flavus and Cladosporium cladosporide was illustrated in table 2. Data recorded after 3 days incubation period showed that the highest concentration (1%) was highly effective against the target fungus as it retarded fungal growth 0.6 % as compared with control followed by the 0.3% concentration with a reduction of 0.1%.

Table 2: Measurement of % inhibition of fungal sp. growth by standardised plant extract after three (03) days

Dominant fungal species	Concentration of Extract (in %)	Fungal Growth (in %)
Aspergillus niger	0 (Blank)	0
	0.1	20
	0.3	78
	0.6	85
	1.0	100
Aspergillus flavus	0 (Blank)	0
	0.1	15
	0.3	82
	0.6	88
	1.0	100
Rhizopus sp.	0 (Blank)	0
	0.1	20
	0.3	32
	0.6	38
	1.0	42
Curvuleria sp	0 (Blank)	0
	0.1	0
	0.3	0
	0.6	0
	1.0	0
Cladoporium cladosporide	0 (Blank)	0
	0.1	56
	0.3	70
	0.6	81
	1.0	100

Antifungal efficacy of aqueous extracts of karanj was observed for inhibition of spore germination against three fungi. Results of the present investigation shows that the

growth with 1.0 % aq. extract of karanj *(Pongamia pinnata)* A. niger, A. flavus and Cladosporium cladosporide were completely inhibited whereas the Curvularia sp. didn't show any affect with any concentration. Significant inhibition of growth of A. niger, A. flavus and Cladosporium cladosporide was observed in the artificial culture media. Singh et al. (2003: 544-553) reported in their paper that the plant alkaloids of Corydalis longipes shows potential antifungal property against some phytopathogenic fungi. Plant extracts of many higher plants like neem have been reported to exhibit antibacterial, antifungal and insecticidal properties under laboratory trials (Satish et al. 1999: 145-147). On the basis of the results obtained during the experiment and reports of success of botanicals on controlling plant pathogenic fungi, the test of organic aqueous extracts holds the promise for organic and ecofriendly management against fungal deterioration of cultural property and monuments.

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Conservation of a European Oil Painting - John Ender, 1846

[1]Paramita Singh Sarkar

Introduction

It is the age of modern and supersonic jet era and the world is changing too quickly depending on technology, public relation and presentation. The author finds it absolutely amazing that one can turn on computer and have immediate access to any information in seconds which past generations encountered in their entire lifetime. Sometimes change is dramatic, immediate and evident and at times it occurs incrementally. It is an exciting time to be a good restorer as the industry experiencing so many dramatic changes. Our realisation and subsequent reaction to these changes could determine the success or even the survival of conservation field. However, these fields continue to provide incredible opportunities to those that seize them and create proactive plans for success.

In the late 20th century, a separate concept of conservation was developed that is more concerned with preserving the work of art for future generations and less with making it look pristine. Restoration is controversial since it often involves some irreversible change to the original material of the art work with the goal of making it “Look Good”. The attitude that has developed in recent years with the development of conservation is an attempt to make all restoration reversible because our intension is to restore the painting without hampering artist’s own original impressions. Therefore, first we should always think about the reversible methods in conservation practices.

Through this paper author has discussed the problems faced during restoration of a European oil painting and reversible methods used as per the most appropriate restoration process.

Johann Nepomuk Ender and His Paintings

Johann Nepomuk Ender, born in Silesian family in Vienna on 4th November 1793, was a famous Austrian painter for his wonderful realistic art works and portraits.

In 1806, he enrolled in the St. Anne Academy of Fine Arts. As a portrait painter, he was successful at an early age. He studied at the Vienna Academy, and when he had hardly attained his majority won its four leading prizes. In 1818-1819, he joined Count Szechuan of Hungary on a tour of Turkey and Greece. In 1820, he went to Italy, and in Florence and Rome produced a number of works from Biblical and historical subjects. After spending a year in Paris, he returned to Vienna in 1827, where devoted his attention to miniature and historical paintings, being professor at the Academy from 1829 to 1850. He died on 16 March, 1854 in Vienna.

Some of his famous works are -

a. Madonna with Slumbering Christ Child (Vienna Museum)

b. Marcus Aurelius on His Death Bed (1814, Esterhazy Gallery)

c. The Crucifixion, his masterpiece (a fresco in the Vienna Cathedral)

d. Orestes Pursued by the Furies (1815)

e. Minerva Showing Ithaca to Ulysses (1816)

f. Assumption (1817)

g. Sleeping at Christ's Sepulchre (1817)

h. Judith (exhibited in 1824)

i. Bacchus Finding Ariadne

Case Study of the Painting

Title: Lady in White Gown (fig. 27a-b)

Dimension: Including Framing - 56 x 39 inch;

Excluding Framing - 54 x 37 inch;

Frame width - 2 inch



fig. 27a Painting before restoration

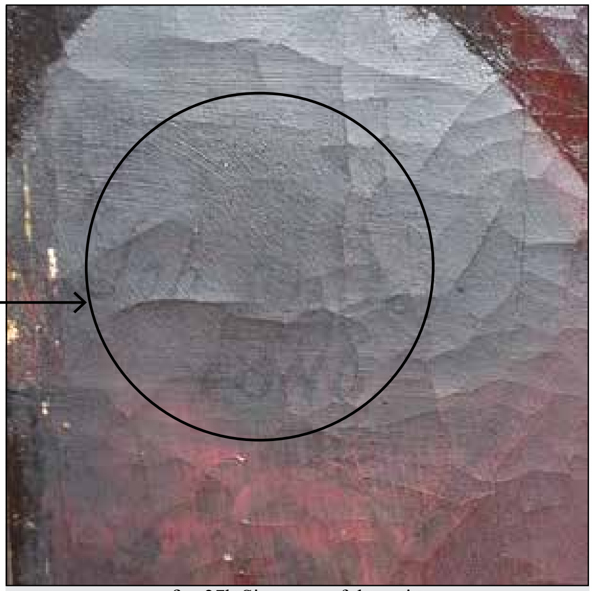


fig. 27b Signature of the artist

Description of the Painting: A beautiful piece of art depicting an internal scene of a Christian family where a lady is standing in traditional attire with other people by her side. The high quality Italian framing adds beauty to this painting.

Provenance: New Delhi (Private Collection)

Description and Condition of the Painting

Close to a century in the humidity of the places in proximity to the sea and the resulting saline air had taken a toll on the painter Prince's creation. Firstly, the detailed visual study of the painting and the visual examination was done in various lights e.g. daylight, slanting light and raking light. Darken varnish, faded paint, canvas holes, flaking of paints, cracks, hard over-paint dust and dirt and moreover sloppy previous restorations (as per previous documentation report from the owner of the painting) were the main

problems of the painting (fig. 28). Heavy moisture had caused “paint blooming” which gave the painting a white and cloudy finish. The edges of the painting had been ripped



fig. 29 Affected portion of the painting with cracks over paints, flaking, etc.

off after years of contact with the frame and the patches of canvas where crudely pasted on the back in earlier repair attempts. Ugly vertical bands or strainer bar marks ran through the bottom. This could have worn out the canvas (fig. 29a-b, 30).



fig. 29a Partial cleaning of the painting

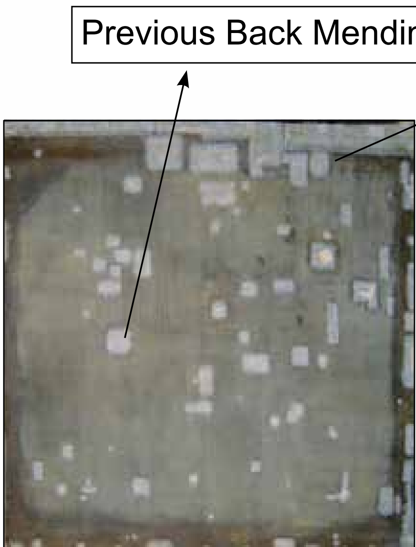


fig. 29b Hardback mending and lining



fig. 30 Scientific study of paint layer

Conservation Planning

A ultra-violet scan of the painting unveiled the slapdash restoration done over the years – the re-applied paint stood out like black patches (fig. 31a-b). Those layers had to be removed because nothing can be allowed to interfere with original painting because the original painting is supreme important to us.

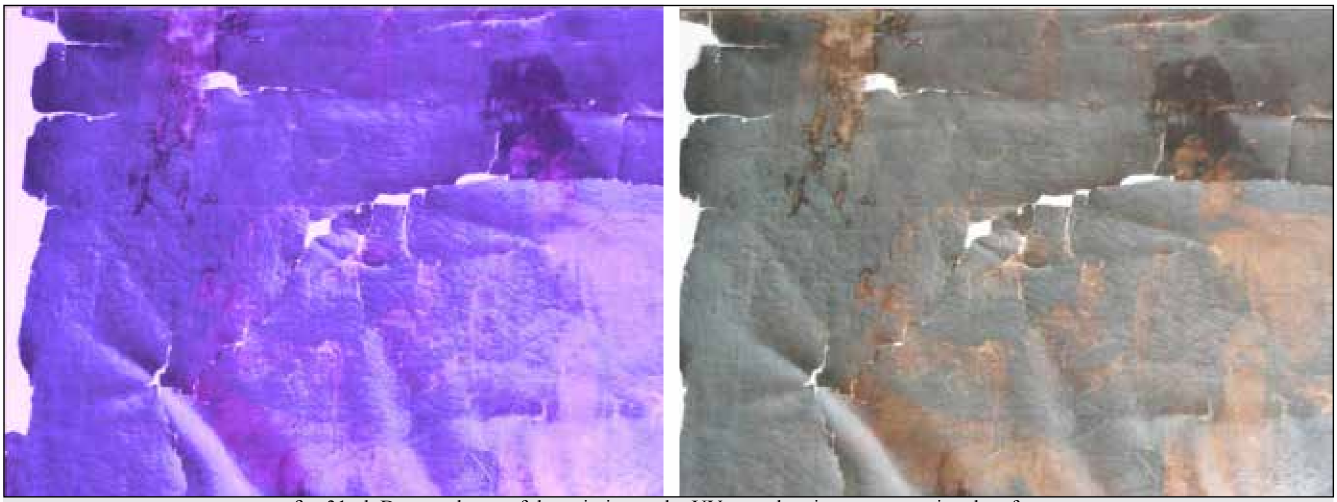


fig. 31a-b Damaged area of the painting under UV rays showing an over-painted surface

The minimum intervention method, in which the painting is not to be interfered with unless really required, meant it had to be ensured that the methods are reversible. Author and her team examined this painting layer by layer and identified the problems. Author stated that the main problem was previous restoration and the dark varnish which the artist had used, a technique employed by oil painters around the edges to give his painting a glossy exterior and seal in the colours. This came undone when the poor quality varnish darkened over the years, obscuring paint details and flattening artist's three dimensional effects.

Conservation Methodology

The conservation process of a photograph or painting includes following steps -

1. De-framing

2. Dismantling

3. Dry brushing (front and back)

4. Consolidation and stabilisation of the flaked area

5. Solvent Cleaning for superficial dust and dirt

6. Varnish cleaning

7. Facing

8. Removal of previous back lining

9. Removal of hard pidicryl and previous inserts from the back side of the painting

10. Preparation for BEVA lining

11. Lining with BEVA 371® on to a cotton canvas cloth

12. Stretching and mending of hole with sized canvas inserts according to original canvas thread

13. Putty filling and texturing

14. Retouching with pigments (Winsor and Newton, Fragonard) and Paraloid - B 72

15. Protective coating

First, a patch test at the left bottom corner of the painting with different cleaning agents for the oil painting was done so as to choose an appropriate cleaning agent. A special solvent was used comprising a mixture of isopropyl alcohol and acetone to dissolve the varnish without affecting the oil paint beneath.

Consolidants plugged the gaps of the cracks and flaked areas in the painting. The old restoration patches pasted on the back of the canvas for repairing and also a hardly pasted canvas were removed with the help of a proper solvent. After that, tears and holes in the canvas were repaired with the help of sized canvas with BEVA. The canvas of the painting including edges was too fragile to handle. So, to provide a support we strengthened and extended by full lining with the help of BEVA and stretched the canvas of the painting.

Filling, levelling and texturing was done according to the brush strokes of the artist in the repaired areas where needed and protective coating was given with Paraloid B-72. Affected areas were painstakingly retouched with specially made foreign restoration paints.

As the one month restoration process slowly peeled back the dust, grime and clumsy retouching, it unveiled the beauty of the painting (fig. 32,33 and 34).



fig. 32 Half cleaning of the painting



fig. 33 Putty filling and texturing



fig. 34 Painting after conservation

Conclusions

Ethical issues in the conservation-restoration of art work are the most essential issues that are to be given top priority. Most of the conservators are well known to all these issues. The most important of these are the compatibility, reversibility and stability of the materials to be added to any artefact. Then also one come across such cases where the person involved in such activity does not care these factors knowingly or unknowingly, and use the material that does not fit to the prescribed medical standards. Money may be one of the causes for such involvement.

Secrecy of the owner may be the other cause, where due to commercial reason; there is no time to decide upon such issues. Whatever the reason may be, such casual approach is never advocated. It ruins the object and makes it difficult for the conservator to improve its condition without substantial loss.

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Further Reading

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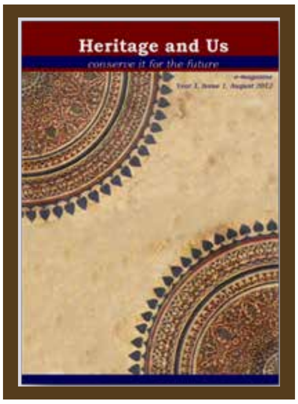
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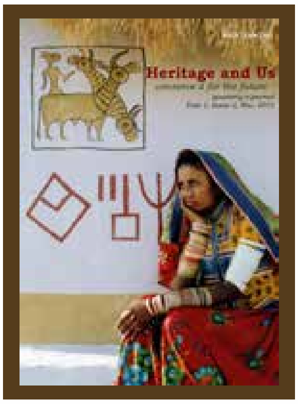
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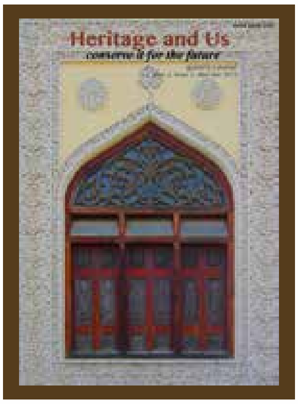
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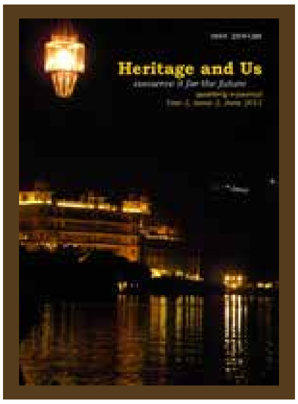
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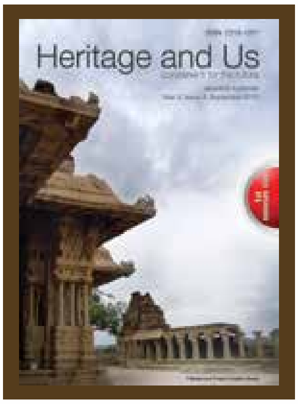
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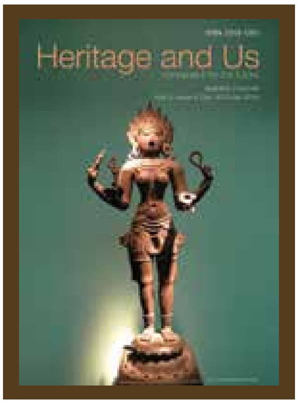


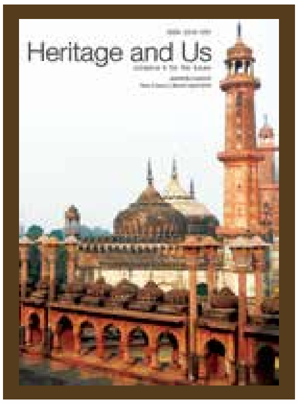














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